Competitive Comparison: Agilent InfiniiVision 4000 X-Series versus Danaher Tektronix MDO4000 Series Oscilloscope

Imagine an oscilloscope that sees everything, triggers on anything, has the ease-of-use of a tablet device...and grows with your projects.
The new 4000 X-Series oscilloscopes are engineered for next-generation performance, delivering waveform update rates 20 times faster than the competition to display the most signal detail. An industry-leading 12.1-inch capacitive touch screen with innovative hardware based InfiniiScan Zone touch triggering provides the most intuitive and responsive oscilloscope measurements. Coupled with a fully upgradable 5-instruments-in-1, the 4000 X-Series provide maximum investment protection.

Danaher Tektronix MDO	Agilent scope	Agilent HSA spectrum analyzer	Agilent BSA spectrum analyzer
MDO4014-3	MSOX4014A	N9340B	N9320B
MDO4034-3	MSOX4034A	N9340B	N9320B
MDO4054-3	MSOX4054A	N9340B	N9320B
MDO4054-6	MSOX4054A	N9342C	N9322C
MDO4104-3	MSOX4104A	N9340B	N9320B
MDO4104-6	MSOX4104A	N9342C	N9322C

InfiniiVision 4000 X-Series:

Oscilloscope experience redefined

- 12.1 inch capacitive touch display
- InfiniiScan Zone touch trigger
- 1,000,000 wfm/sec
- Standard segmented memory
- Bandwidth upgradable up to a class-leading 1.5 GHz
- Fully upgradable 5 instrument in 1
  - Analog channels
  - Digital channels (MSO)
  - Protocol analysis
  - Dual-channel WaveGen
  - Digital voltmeter (DVM)
- InfiniiView oscilloscope analysis software

Agilent-designed *MegaZoom* IV custom ASIC technology powers the fastest waveform update rates, responsive deep memory, integrated MSO, integrated industry-exclusive WaveGen, and integrated protocol analyzer.

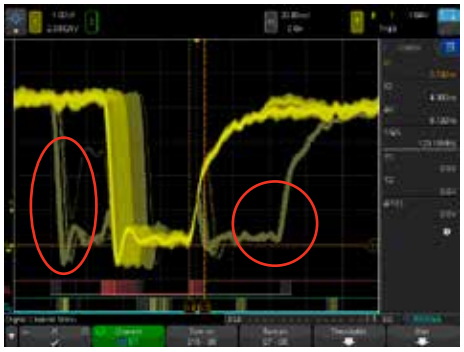
	Agilent 4000 X-Series		Danaher Tektronix MDO4000	
Bandwidth	200/350/500 MHz, 1/1.5 GHz	√	100/350/500 MHz, 1 GHz	x
Upgradable bandwidth	Yes	√	Not available	x
Sample rate	Up to 5 GSa/s (2X more)	√	Up to 2.5 GSa/s	x
Standard memory depth	Up to 4 M	x	Up to 20 M (5X more)	√
Segmented memory	Yes	√	Not available	x
Display size	12.1" (35% more viewing area)	√	10.4"	x
Touch screen	Capacitive touch screen with designed-for-touch GUI	√	Not available	x
Max update rate - Analog ch. only	> 1,000,000 wfms/s (> 16X faster)	√	62,000 wfms/s	x
Max update rate - Analog and RF	Not available		2,420 wfms/s	
Max update rate - Analog and MSO	> 1,000,000 wfms/s (> 11,000X faster)	√	90 wfms/s	x
Max update rate - Analog and MSO and serial	> 1,000,000 wfms/s (> 33,000X faster)	√	30 wfms/s	x
Max update rate - Analog, MSO, RF and serial	Not available		1 update every 9 seconds	
Hardware-based zone trigger	Yes	√	Not available	x
WaveGen	Yes - dual-channel with arb	√	Not available	x
Integrated digital voltmeter	Yes	√	Not available	x
Serial decode options	Yes - 10 available	√	Yes - 10 available	√
Hardware-based serial decode	Yes - No impact to update rate	√	Not available	x
Hardware-based mask test	Yes - Up to 240,000 wfms/sec	√	Not available	x
Measurements	35, 10 simultaneous, cursor gating	√	29, 8 simultaneous, cursor gating	√
Math functions	Std. advanced math, up to 4 cascades	√	Std. advance math, equation editor	√
USB keyboard and mouse	Yes	√	Keyboard only	x
Standard passive probe	700 MHz passive	x	1 GHz passive (43% more)	√
System bandwidth with passive probe	700 MHz	√	780 MHz	√

Anticipate ___Accelerate ___Achieve

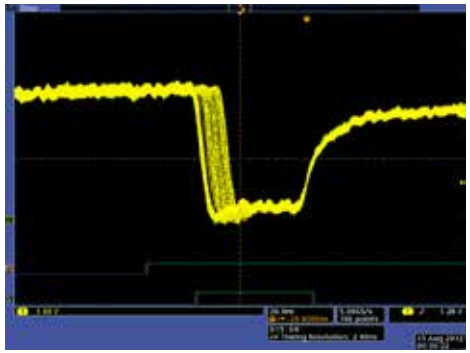
Agilent Technologies

Experience the speed

With one million wfm/sec update rate:



Both analog and digital channels are turned on. Many infrequent glitches and metastable signals were observed after 10 second of acquisition on the 4000 X-Series.

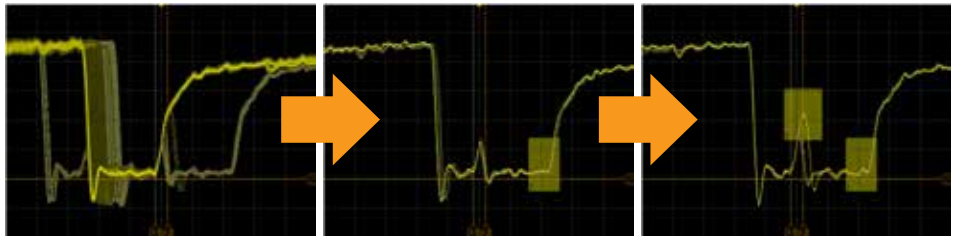


Both analog and digital channels are turned on. Even after 60 seconds of acquisition, Tektronix MDO4000 failed to capture any glitches or metastable signals.

> 1,000,000 waveforms per second update rate allows you to see infrequent events and subtle signals details that the Tektronix MDO4000 will miss. Because of the uncompromised MegaZoom IV memory architecture, the 4000 X-Series won't slow down even with digital channels, protocol decoding, measurements, and math functions turned on.

Experience the usability

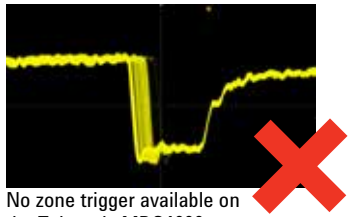
With the InfiniiScan Zone touch trigger and 12.1 inch capacitive touch screen:



With the InfiniiScan Zone touch trigger, if you can see it, you can trigger on it.

It is as simple as, finding the signal and drawing the zone. The metastable signal is isolated immediately.

Add a second zone to further isolate glitches above the logical threshold.



No zone trigger available on the Tektronix MDO4000.

Three-Year Warranty

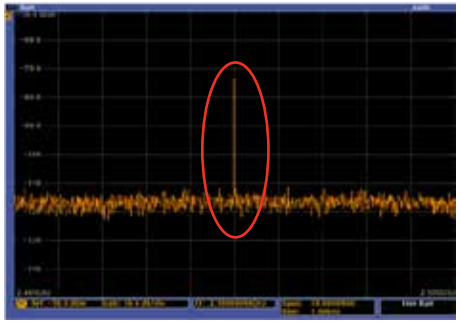
www.agilent.com/find/ThreeYearWarranty

Tek MDO4000 = compromised scope and built-in spectrum analyzer

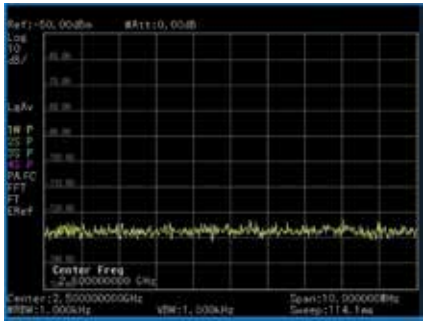
Agilent 4000X Scope + Agilent HSA/BSA = superior products in each domain

Agilent HSA/BSA offers

- Better performance and insight on the signals of interest
- > 10 dB better DANL performance
- Better residual response performance which makes you confident with the measurement results
- No coupling of analog channels into RF channel, significant in the MDO4000
- Richer spectrum and signal analysis features needed when doing RF domain work



A typical residual response of MDO4000 which may impact measurement accuracy.



BSA has a clean spectrum with the same settings and > 10 dB better DANL.

	Agilent BSA spectrum analyzer N9320B/ N9322C	Tektronix MDO4000	Agilent HSA spectrum analyzer N9340B/ N9342C/N9343C/N9344C
Frequency range	9 kHz to 3 GHz/7 GHz	50 kHz to 3 GHz/ 6 GHz	100 kHz to 3/7/13.6/ 20 GHz (tunable to 9 kHz)
RBW	10 Hz to 1 MHz N9320B	20 Hz to 10 MHz	10 Hz to 3 MHz
	10 Hz to 3 MHz N9322C		
Attenuation	0 to 70 dB in 1 dB steps N9320B	Not user adjustable	0 to 51 dB in 1 dB steps
	0 to 50 dB in 1 dB steps N9322C		
DANL	–148 dBm/Hz @ 3 GHz N9320B	–148 dBm/Hz @ 3 GHz	–158 dBm/Hz with preamp @ 3 GHz
	–155 dBm/Hz @ 6 GHz N9322C	–140 dBm/Hz @ 6 GHz	–155 dBm/Hz with preamp @ 6 GHz
Φ Noise (100 kHz offset)	–100 dBc/Hz N9320B	–95 dBc/Hz	–97 dBc/Hz
	–97 dBc/Hz N9322C		
Level accuracy	± 1.5 dB (± 0.5 dB typical)	± 1.5 dB (± 0.5 dB typical)	± 1.5 dB (± 0.6 dB typical)
Residual response	–83 dBm N9320B	–78 dBm	–90 dBm (–98 dBm typical)
	–90 dBm N9322C		
ADC resolution	12-Bit	8-Bit	12-bit

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